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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,959	03/01/2004	Takemori Takayama	03773/LH	2156

1933 7590 06/19/2007

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EXAMINER
YEE, DEBORAH

ART UNIT	PAPER NUMBER
1742	

MAIL DATE	DELIVERY MODE
06/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/790,959	TAKAYAMA, TAKEMORI	
	Examiner	Art Unit	
	Deborah Yee	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 April 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12,20-23 and 25-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12,20-23 and 25-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 November 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4-17-07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 17, 2007 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1 to 12, 20 to 23 and 25 to 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over European patent 950723 (hereinafter EP'723) cited by applicant in IDS dated April 17, 2007.

4. EP'723 in claims 1 to 10 on page 13 discloses a rolling element (gear) made from a steel material comprising a composition with constituents whose wt.% ranges overlap those recited by the claims. Moreover, steel material is case-hardened such that the surface comprises martensite and retained austenite dispersed with carbides, nitrides, carbonitrides and cementite having an average particle size of less than 0.3 μm

(overlaps 0.2 to 5 μm) in vol.% ranges that overlap those recited by the claims. Note that such overlap establishes a prima facie case of obviousness because it would be obvious for one skilled in the art to select the claimed ranges over the broader disclosure of the prior art since the prior art teaches the same utility, see MPEP 2144.05.

5. EP'723 in claims 1 and 5 discloses cementite dispersed in an amount of up to 30 vol.%, which overlaps 2 to 15 vol% recited by claim 2. Even though a Cr concentration of 2.5 to 10 wt% in the cementite ($(Fe,Cr)_3C$) as recited by claim 1 is not taught by prior art, such would be expected since prior art in paragraph 43 teaches the Cr concentration heat treating step of reheating after hardening at A1 to less than 900C.

6. EP'723 in paragraph 25 discloses a residual retained austenite at 20 to 80 vol.% with a preferred range of 20 to 60 vol.% and is within the range of 10 to 50 vol.% recited by claim 3.

7. Even though prior art does not teach prior austenite grain having an ASTM grain size No. 10 as recited by claim 3, such would be expected since composition and process of making are closely met. Moreover, prior austenite grain size is an intermediate property to make a final product and would not be of patentable weight.

8. Prior art claims 1 to 11 disclose alloying constituents with wt% ranges that would overlap and therefore suggest the compositional limitations recited by dependent claims.

9. Similar to claims 10 to 12, EP'723 in paragraphs 1 and 63 and figure 12 disclose producing a gear, and also shot peening surface to generate a compressive residual stress of 50 Kgf/mm2 or more to improve fatigue strength.

10. With regard to method claims, prior art in paragraphs 43, 47 and 63 teaches hardening by carburizing or carbonitriding comprising the steps of heating at 930 to 1100C (within quenching temperature range of 900 to 1050C recited by claim 9) followed by rapid quenching to less than A1 temperature to obtain a martensitic microstructure and then shot peening surface to generate a compressive residual stress of 50 Kgf/mm2 or more to improve fatigue strength. Moreover, an additional thermal heat treatment for spheroidizing the cementite as recited by claim 22 is taught by EP'723 in paragraph 43 by reheating to A1 temperature or more and less than 900C.

11. Even though induction heating and at a heating rate of 150C/sec or more as recited by one or more of the claims is not taught by prior art, such would not be a patentable difference since choice of heating means would be a matter well within the skill of the artisan and productive of no new and unexpected results. Moreover preheating before hardening is a conventional practice well known in the art to create temperature uniformity and would be a matter of choice well within in the skill of the artisan to incorporate.

12. Even though prior art does not teach a soluble carbon concentration of 0.3 to 0.8% in the martensite of the quench hardened layer as recited by one or more of the claims, such would be expected since composition and process limitations are closely met and in absence of proof to the contrary.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deborah Yee whose telephone number is 571-272-1253. The examiner can normally be reached on monday-friday 6:00am-2:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Deborah Yee
Primary Examiner
Art Unit 1742

DY